

<110> Bristol-Myers Squibb Company

<120> POLYNUCLEOTIDE ENCODING TWO NOVEL HUMAN POTASSIUM CHANNEL BETA-SUBUNITS,
K+betaM4 and K+betaM5

<130> D0115NP

<150> US 60/272,190

<151> 2001-02-28

<150> US 60/274,258

<151> 2001-03-07

<160> 98

<170> PatentIn version 3.0

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Leu Cys Cys Phe Cys Lys Gln Arg Asn Lys Ser Leu Gly Thr Tyr Pro	
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ggg gtc cca ggg aat gcc ctg tgg ctc ctg acc tcc ccc gcc tgt aat	145
Gly Val Pro Gly Asn Ala Leu Trp Leu Leu Thr Ser Pro Ala Cys Asn	
35 40 45	

gct ctg agc act tca gca gta atg cat gga aga gat aag ggg tct gtg	193
Ala Leu Ser Thr Ser Ala Val Met His Gly Arg Asp Lys Gly Ser Val	
50 55 60	

acc cat gga act gtc caa gtc ctc tct gac acc cgc ttc ttt tcc tgc	241
Thr His Gly Thr Val Gln Val Leu Ser Asp Thr Arg Phe Phe Ser Cys	
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cgt gaa gga cta ctt cca gca acc cag tct cct gcc atg tcc gac ccc	289
Arg Glu Gly Leu Leu Pro Ala Thr Gln Ser Pro Ala Met Ser Asp Pro	
80 85 90 95	

atc acg ctg aac gtc ggg ggg aag ctc tat aca acc tca ctg gcg acc	337
Ile Thr Leu Asn Val Gly Gly Lys Leu Tyr Thr Thr Ser Leu Ala Thr	
100 105 110	

ctg acc agc ttc cct gac tcc atg cta ggc gcc atg ttc agc ggg aag	385
Leu Thr Ser Phe Pro Asp Ser Met Leu Gly Ala Met Phe Ser Gly Lys	
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Met Pro Thr Lys Arg Asp Ser Gln Gly Asn Cys Phe Ile Asp Arg Asp	
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Gly Lys Val Phe Arg Tyr Ile Leu Asn Phe Leu Arg Thr Ser His Leu	
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Asp Phe Tyr Gln Val Gln Pro Leu Ile Glu Ala Leu Gln Glu Lys Glu	
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gtg gag ctc tcc aag gcc gag aag aat gcc atg ctc aac atc aca ctg	625
Val Glu Leu Ser Lys Ala Glu Lys Asn Ala Met Leu Asn Ile Thr Leu	
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aac cag cgt gtg cag acg gtc cac ttc act gtg cgc gag gca ccc cag	673
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210 215 220	
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Ile Tyr Ser Leu Ser Ser Ser Ser Met Glu Val Phe Asn Ala Asn Ile	
225 230 235	
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Phe Ser Thr Ser Cys Leu Phe Leu Lys Leu Leu Gly Ser Lys Leu Phe	
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Tyr Cys Ser Asn Gly Asn Leu Ser Ser Ile Thr Ser His Leu Gln Asp	
260 265 270	
ccc aac cac ctg act ctg gac tgg gtg gcc aat gtg gag ggc ctg cca	865
Pro Asn His Leu Thr Leu Asp Trp Val Ala Asn Val Glu Gly Leu Pro	
275 280 285	
gag gag gag tac acc aag cag aac ctc aag agg ctc tgg gtg gtg ccc	913
Glu Glu Glu Tyr Thr Lys Gln Asn Leu Lys Arg Leu Trp Val Val Pro	
290 295 300	
gcc aac aag cag atc aac agc ttc cag gtc ttc gtg gaa gag gta ctg	961
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aaa atc gct ctg agc gat ggc ttc tgc atc gat tct tct cac cca cat	1009
Lys Ile Ala Leu Ser Asp Gly Phe Cys Ile Asp Ser Ser His Pro His	
320 325 330 335	
gct ctg gat ttt atg aac aat aag att att cga tta ata cgg tac agg	1057

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340 345 350

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His Gly Thr Val Gln Val Leu Ser Asp Thr Arg Phe Phe Ser Cys Arg
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85 90 95

Thr Leu Asn Val Gly Gly Lys Leu Tyr Thr Thr Ser Leu Ala Thr Leu
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Thr Ser Phe Pro Asp Ser Met Leu Gly Ala Met Phe Ser Gly Lys Met
115 120 125

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130 135 140

Lys Val Phe Arg Tyr Ile Leu Asn Phe Leu Arg Thr Ser His Leu Asp
145 150 155 160

Leu Pro Glu Asp Phe Gln Glu Met Gly Leu Leu Arg Arg Glu Ala Asp
165 170 175

Phe Tyr Gln Val Gln Pro Leu Ile Glu Ala Leu Gln Glu Lys Glu Val
180 185 190

Glu Leu Ser Lys Ala Glu Lys Asn Ala Met Leu Asn Ile Thr Leu Asn
195 200 205

Gln Arg Val Gln Thr Val His Phe Thr Val Arg Glu Ala Pro Gln Ile
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245 250 255

Cys Ser Asn Gly Asn Leu Ser Ser Ile Thr Ser His Leu Gln Asp Pro
260 265 270

Asn His Leu Thr Leu Asp Trp Val Ala Asn Val Glu Gly Leu Pro Glu
275 280 285

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His	Ile	Asp	Val	Gly	Gly	His	Met	Tyr	Thr	Ser	Ser	Leu	Ala	Thr	Leu	
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Pro	Ile	Val	Leu	Asp	Ser	Leu	Lys	Gln	His	Tyr	Phe	Ile	Asp	Arg	Asp	
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Gly	Gln	Met	Phe	Arg	Tyr	Ile	Leu	Asn	Phe	Leu	Arg	Thr	Ser	Lys	Leu	
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Leu	Ile	Pro	Asp	Asp	Phe	Lys	Asp	Tyr	Thr	Leu	Leu	Tyr	Glu	Glu	Ala	
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Lys	Tyr	Phe	Gln	Leu	Gln	Pro	Met	Leu	Leu	Glu	Met	Glu	Arg	Trp	Lys	
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Gln	Asp	Arg	Glu	Thr	Gly	Arg	Phe	Ser	Arg	Pro	Cys	Glu	Cys	Leu	Val	
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Lys	Ser	Leu	Ile	Glu	Glu	Val	Phe	Pro	Glu	Ile	Gly	Asp	Val	Met	Cys	
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Asn	Ser	Val	Asn	Ala	Gly	Trp	Asn	His	Asp	Ser	Thr	His	Val	Ile	Arg	
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Phe	Pro	Leu	Asn	Gly	Tyr	Cys	His	Leu	Asn	Ser	Val	Gln	Val	Leu	Glu
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Thr	Arg	Ser 35	Pro	Val	Ser	Pro	Leu 40	Ala	Ala	Gln	Gly	Ile 45	Pro	Leu	Pro
Ala	Gln 50	Leu	Thr	Lys	Ser	Asn 55	Ala	Pro	Val	His	Ile 60	Asp	Val	Gly	Ser
His 65	Met	Tyr	Thr	Ser	Ser 70	Leu	Ala	Thr	Leu	Thr 75	Lys	Tyr	Pro	Asp	Ser 80
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Val	Leu	Ser 115	Phe	Leu	Arg	Thr	Ser 120	Lys	Leu	Leu	Leu	Pro 125	Asp	Asp	Phe
Lys	Asp 130	Phe	Ser	Leu	Leu	Tyr 135	Glu	Glu	Ala	Arg	Tyr 140	Tyr	Gln	Leu	Gln
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Arg	Arg	Ser	Arg	Ala 165	Cys	Asp	Cys	Leu	Val 170	Val	Arg	Val	Thr	Pro 175	Asp
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Val	Phe	Pro 195	Glu	Thr	Gly	Asp 200	Val	Met	Cys	Asn	Ser	Val 205	Asn	Ala	Gly

(The following are the names of the individuals who have been identified as having been involved in the investigation.)

225	230								235					240			
Val	Val	Ala	Leu	His	Ile	Ser	Pro	Asp	Leu	Gly	Glu	Arg	Ile	Met	Leu		
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ggctgaatgg	caaggagtac	aagtgcgaag	tctccaacaa	agccctccca	acccccatcg	360
agaaaacat	ctccaaagcc	aaagggcagc	cccgagaacc	acaggtgtac	accctgcccc	420
catcccggga	tgagctgacc	aagaaccagg	tcagcctgac	ctgcctggtc	aaaggcttct	480
atccaagcga	catcgccgtg	gagtgggaga	gcaatgggca	gccggagaac	aactacaaga	540
ccacgcctcc	cgtgctggac	tccgacggct	cctttcttct	ctacagcaag	ctcaccgtgg	600
acaagagcag	gtggcagcag	gggaacgtct	tctcatgctc	cgtgatgcat	gaggctctgc	660
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 tcacactgaa ccagcgtgtg cagacggtcc acttcaactgt gcgcgaggca cccagatct 600
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11

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Arg Arg Arg Pro Leu Ala Leu Pro Ala Leu Arg Leu Gly Glu Leu Pro
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gcc aat cag ggc gga acc agc gcg gcg tcg gcc agt agc ggg agg cgg 144
Ala Asn Gln Gly Gly Thr Ser Ala Ala Ser Ala Ser Ser Gly Arg Arg
35 40 45

tcg ggt cag gcc cca gct ggg cgc gag cgg gtc ggc gtt gag gga gcc 192
Ser Gly Gln Ala Pro Ala Gly Arg Glu Arg Val Gly Val Glu Gly Ala
50 55 60

acc gcc ctc ccg cct gcg cac tgc ctc tcg ccc ccc tcc ggc cag ccc 240

Thr 65	Ala	Leu	Pro	Pro	Ala 70	His	Cys	Leu	Ser	Pro 75	Pro	Ser	Gly	Gln	Pro 80	
gca Ala	gcc Ala	ggc Gly	cgc Arg	gtc Val	atg Met	cca Pro	ggc Gly	gct Ala	gct Ala	cgg Arg	cga Arg	gcc Ala	aga Arg	ggg Gly	atg Met	288
gtg Val	gta Val	gtc Val	acg Thr	ggg Gly	cgg Arg	gag Glu	cca Pro	gac Asp	agc Ser	cgt Arg	cgt Arg	cag Gln	gac Asp	ggg Gly	gcc Ala	336
atg Met	tcc Ser	agc Ser	tct Ser	gac Asp	gcc Ala	gaa Glu	gac Asp	gac Asp	ttt Phe	ctg Leu	gag Glu	ccg Pro	gcc Ala	acg Thr	ccg Pro	384
acg Thr	gcc Ala	acg Thr	cag Gln	gcg Ala	ggg Gly	cac His	gcg Ala	ctg Leu	ccc Pro	ctg Leu	ctg Pro	cca Pro	cag Gln	gag Glu	ttt Phe	432
cct Pro	gag Glu	gtt Val	gtt Val	ccc Pro	ctt Leu	aac Asn	atc Ile	gga Gly	ggg Gly	gct Ala	cac His	ttc Phe	act Thr	aca Thr	cgc Arg	480
ctg Leu	tcc Ser	aca Thr	ctg Leu	cgg Arg	tgc Cys	tac Tyr	gaa Glu	gac Asp	acc Thr	atg Met	ttg Leu	gca Ala	gcc Ala	atg Met	ttc Phe	528
agt Ser	ggg Gly	cgg Arg	cac His	tac Tyr	atc Ile	ccc Pro	aca Thr	gac Asp	tcc Ser	gag Glu	ggc Gly	cgg Arg	tac Tyr	ttc Phe	atc Ile	576
gac Asp	cga Arg	gat Asp	ggc Gly	aca Thr	cac His	ttt Phe	gga Gly	gat Asp	gtg Val	ctg Leu	aat Asn	ttc Phe	ctg Leu	cgc Arg	tca Ser	624
ggg Gly	gac Asp	ctc Leu	cca Pro	ccc Pro	agg Arg	gag Glu	cgt Arg	gtt Val	cga Arg	gct Ala	gtg Val	tac Tyr	aaa Lys	gag Glu	gcc Ala	672
cag Gln	tac Tyr	tat Tyr	gcc Ala	atc Ile	ggg Gly	ccc Pro	ctc Leu	ctg Leu	gag Glu	cag Gln	ctg Leu	gag Glu	aac Asn	atg Met	cag Gln	720
cca Pro	ctg Leu	aag Lys	ggc Gly	gag Glu	aag Lys	gtg Val	cgc Arg	caa Gln	gcg Ala	ttt Phe	ctg Leu	gga Gly	ctc Leu	atg Met	ccc Pro	768
tat Tyr	tac Tyr	aaa Lys	gac Asp	cac His	ttg Leu	gag Glu	cgg Arg	att Ile	gtg Val	gag Glu	atc Ile	gcc Ala	cgg Arg	ctg Leu	cgt Arg	816
gcg Ala	gtc Val	cag Gln	cgg Arg	aag Lys	gcc Ala	cgc Arg	ttt Phe	gcc Ala	aag Lys	ctc Leu	aag Lys	agc Ser	ttg Leu	aca Thr	cct Pro	864
tcc Ser	tgg Trp	cta Leu	atg Met	agt Ser	gtc Val	ctc Leu	atc Ile	aag Lys	atg Met	ccc Pro	cct Pro	gga Gly	gtc Val	aca Thr	tca Ser	912

290	295	300	
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Trp Ile Asn Ala Glu Arg Arg Leu Tyr Leu Glu Thr Pro Ile Gly Pro			
305	310	315	320
gag aga cag aac aat gag aag aaa tcc cct gtc cag ttg cct gca gga			1008
Glu Arg Gln Asn Asn Glu Lys Lys Ser Pro Val Gln Leu Pro Ala Gly			
	325	330	335
gta ttc caa cac ttc atg ggc tagaggattc cattgagatg gggtttacgt			1059
Val Phe Gln His Phe Met Gly			
	340		
cttgatttttg aacacctgtc agcactgttc tctgtttgca tggcaattct gaccctttta			1119
tggcaacaac acccctggga caaccagat ttgtagattg agatccaaag gtagaatttc			1179
cagacagtcc aaccaaggta tcaagtgatg tttccagagt ggaaggctct caccgtgtcc			1239
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20 25 30

Ala Asn Gln Gly Gly Thr Ser Ala Ala Ser Ala Ser Ser Gly Arg Arg
35 40 45

Ser Gly Gln Ala Pro Ala Gly Arg Glu Arg Val Gly Val Glu Gly Ala
50 55 60

Thr Ala Leu Pro Pro Ala His Cys Leu Ser Pro Pro Ser Gly Gln Pro
65 70 75 80

Ala Ala Gly Arg Val Met Pro Gly Ala Ala Arg Arg Ala Arg Gly Met
85 90 95

Val Val Val Thr Gly Arg Glu Pro Asp Ser Arg Arg Gln Asp Gly Ala
100 105 110

Met Ser Ser Ser Asp Ala Glu Asp Asp Phe Leu Glu Pro Ala Thr Pro
115 120 125

Thr Ala Thr Gln Ala Gly His Ala Leu Pro Leu Leu Pro Gln Glu Phe
130 135 140

Pro Glu Val Val Pro Leu Asn Ile Gly Gly Ala His Phe Thr Thr Arg
145 150 155 160

Leu Ser Thr Leu Arg Cys Tyr Glu Asp Thr Met Leu Ala Ala Met Phe
165 170 175

Ser Gly Arg His Tyr Ile Pro Thr Asp Ser Glu Gly Arg Tyr Phe Ile
180 185 190

Asp Arg Asp Gly Thr His Phe Gly Asp Val Leu Asn Phe Leu Arg Ser
195 200 205

Gly Asp Leu Pro Pro Arg Glu Arg Val Arg Ala Val Tyr Lys Glu Ala
210 215 220

Gln Tyr Tyr Ala Ile Gly Pro Leu Leu Glu Gln Leu Glu Asn Met Gln
225 230 235 240

Pro Leu Lys Gly Glu Lys Val Arg Gln Ala Phe Leu Gly Leu Met Pro
245 250 255

Tyr Tyr Lys Asp His Leu Glu Arg Ile Val Glu Ile Ala Arg Leu Arg
260 265 270

Ala Val Gln Arg Lys Ala Arg Phe Ala Lys Leu Lys Ser Leu Thr Pro
275 280 285

Ser Trp Leu Met Ser Val Leu Ile Lys Met Pro Pro Gly Val Thr Ser
290 295 300

Trp Ile Asn Ala Glu Arg Arg Leu Tyr Leu Glu Thr Pro Ile Gly Pro
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Glu Arg Gln Asn Asn Glu Lys Lys Ser Pro Val Gln Leu Pro Ala Gly
325 330 335

Val Phe Gln His Phe Met Gly
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<400> 25

Met Ser Thr Val Val Glu Leu Asn Val Gly Gly Glu Phe His Thr Thr
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Thr Leu Gly Thr Leu Arg Lys Phe Pro Gly Ser Lys Leu Ala Glu Met
20 25 30

Phe Ser Ser Leu Ala Lys Ala Ser Thr Asp Ala Glu Gly Arg Phe Phe
35 40 45

Ile Asp Arg Pro Ser Thr Tyr Phe Arg Pro Ile Leu Asp Tyr Leu Arg
50 55 60

Thr Gly Gln Val Pro Thr Gln His Ile Pro Glu Val Tyr Arg Glu Ala
65 70 75 80

Gln Phe Tyr Glu Ile Lys Pro Leu Val Lys Leu Leu Glu Asp Met Pro

85					90					95					
Gln	Ile	Phe	Gly	Glu	Gln	Val	Ser	Arg	Lys	Gln	Phe	Leu	Leu	Gln	Val
			100					105					110		
Pro	Gly	Tyr	Ser	Glu	Asn	Leu	Glu	Leu	Met	Val	Arg	Leu	Ala	Arg	Ala
		115					120					125			
Glu	Ala	Ile	Thr	Ala	Arg	Lys	Ser	Ser	Val	Leu	Val	Cys	Leu	Val	Glu
	130					135					140				
Thr	Glu	Glu	Gln	Asp	Ala	Tyr	Tyr	Ser	Glu	Val	Leu	Cys	Phe	Leu	Gln
	145					150					155				160
Asp	Lys	Lys	Met	Phe	Lys	Ser	Val	Val	Lys	Phe	Gly	Pro	Trp	Lys	Ala
				165					170					175	
Val	Leu	Asp	Asn	Ser	Asp	Leu	Met	His	Cys	Leu	Glu	Met	Asp	Ile	Lys
			180					185					190		
Ala	Gln	Gly	Tyr	Lys	Val	Phe	Ser	Lys	Phe	Tyr	Leu	Thr	Tyr	Pro	Thr
		195					200					205			
Lys	Arg	Asn	Glu	Phe	His	Phe	Asn	Ile	Tyr	Ser	Phe	Thr	Phe	Thr	Trp
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Trp															
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Ala	Ala	Thr	Arg	Thr	Thr	Ser	Phe	Lys	Gly	Thr	Ser	Pro	Ser	Ser	Lys
			20					25				30			
Tyr	Val	Lys	Leu	Asn	Val	Gly	Gly	Ala	Leu	Tyr	Tyr	Thr	Thr	Met	Gln
		35				40						45			
Thr	Leu	Thr	Lys	Gln	Asp	Thr	Met	Leu	Lys	Ala	Met	Phe	Ser	Gly	Arg
	50					55					60				
Met	Glu	Val	Leu	Thr	Asp	Ser	Glu	Gly	Trp	Ile	Leu	Ile	Asp	Arg	Cys
	65					70					75				80
Gly	Lys	His	Phe	Gly	Thr	Ile	Leu	Asn	Tyr	Leu	Arg	Asp	Gly	Ala	Val
				85					90					95	
Pro	Leu	Pro	Glu	Ser	Arg	Arg	Glu	Ile	Glu	Glu	Leu	Leu	Ala	Glu	Ala
			100					105					110		

Lys Tyr Tyr Leu Val Gln Gly Leu Val Glu Glu Cys Gln Ala Ala Leu
115 120 125

Gln Asn Lys Asp Thr Tyr Glu Pro Phe Cys Lys Val Pro Val Ile Thr
130 135 140

Ser Ser Lys Glu Glu Gln Lys Leu Ile Ala Thr Ser Asn Lys Pro Ala
145 150 155 160

Val Lys Leu Leu Tyr Asn Arg Ser Asn Asn Lys Tyr Ser Tyr Thr Ser
165 170 175

Asn Ser Asp Asp Asn Met Leu Lys Asn Ile Glu Leu Phe Asp Lys Leu
180 185 190

Ser Leu Arg Phe Asn Gly Arg Val Leu Phe Ile Lys Asp Val Ile Gly
195 200 205

Asp Glu Ile Cys Cys Trp Ser Phe Tyr Gly Gln Gly Arg Lys Ile Ala
210 215 220

Glu Val Cys Cys Thr Ser Ile Val Tyr Ala Thr Glu Lys Lys Gln Thr
225 230 235 240

Lys Val Glu Phe Pro Glu Ala Arg Ile Tyr Glu Glu Thr Leu Asn Ile
245 250 255

Leu Leu Tyr Glu Ala Gln Asp Gly Arg Gly Pro Asp Asn Ala Leu Leu
260 265 270

Glu Ala Thr Gly Gly Ala Ala Gly Arg Ser His His Leu Asp Glu Asp
275 280 285

Glu Glu Arg Glu Arg Ile Glu Arg Val Arg Arg Ile His Ile Lys Arg
290 295 300

Pro Asp Asp Arg Ala His Leu His Gln
305 310

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<213> Drosophila melanogaster

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Met Ser Glu Ser Met Ser Gly Asp His Lys Ile Leu Leu Lys Gly His
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20 25 30

Thr Ile Gly Thr Leu Thr Lys Asn Asn Asp Thr Met Leu Ser Ala Met
35 40 45

Phe Ser Gly Arg Met Glu Val Leu Thr Asp Ser Glu Gly Trp Ile Leu
50 55 60

Ile Asp Arg Cys Gly Asn His Phe Gly Ile Ile Leu Asn Tyr Leu Arg
65 70 75 80

Asp Gly Thr Val Pro Leu Pro Glu Thr Asn Lys Glu Ile Ala Glu Leu
85 90 95

Leu Ala Glu Ala Lys Tyr Tyr Cys Ile Thr Glu Leu Ala Ile Ser Cys
100 105 110

Glu Arg Ala Leu Tyr Ala His Gln Glu Pro Lys Pro Ile Cys Arg Ile
115 120 125

Pro Leu Ile Thr Ser Gln Lys Glu Glu Gln Leu Leu Leu Ser Val Ser
130 135 140

Leu Lys Pro Ala Val Ile Leu Val Val Gln Arg Gln Asn Asn Lys Tyr
145 150 155 160

Ser Tyr Thr Ser Thr Ser Asp Asp Asn Leu Leu Lys Asn Ile Glu Leu
165 170 175

Phe Asp Lys Leu Ser Leu Arg Phe Asn Glu Arg Ile Leu Phe Ile Lys
180 185 190

Asp Val Ile Gly Pro Ser Glu Ile Cys Cys Trp Ser Phe Tyr Gly His
195 200 205

Gly Lys Lys Val Ala Glu Val Cys Cys Thr Ser Ile Val Tyr Ala Thr
210 215 220

Asp Arg Lys His Thr Lys Val Glu Phe Pro Glu Ala Arg Ile Tyr Glu
225 230 235 240

Glu Thr Leu Gln Val Leu Leu Tyr Glu Asn Arg Asn Ala Pro Asp Gln
245 250 255

Glu Leu Met Gln Ala Thr Ser Ser Ala Arg Val Gly Ser Ala Ser Gly
260 265 270

Thr Ser Ile Asn Gln Tyr Thr Ser Asp Glu Glu Glu Glu Arg Thr Gly
275 280 285

Leu Ala Arg Leu Arg Ser Asn Lys Arg Asn Asn Pro Ser
290 295 300

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<213> Caenorhabditis elegans

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Lys Thr Thr Ile Phe Thr Leu Cys Lys His Asp Ser Met Leu Lys Thr

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Met	Phe	Cys	Thr	Asp	Val	Pro	Val	Thr	Lys	Asn	Glu	Glu	Gly	Ser	Val
		35					40					45			
Phe	Ile	Asp	Arg	Asp	Ser	Lys	His	Phe	Arg	Leu	Ile	Leu	Asn	Phe	Leu
	50					55					60				
Arg	Asp	Gly	Gln	Ile	Ala	Leu	Pro	Asp	Ser	Asp	Arg	Glu	Val	Arg	Glu
65					70					75					80
Val	Leu	Ala	Glu	Ala	Ser	Tyr	Phe	Leu	Leu	Asp	Pro	Leu	Ile	Glu	Leu
				85					90					95	
Cys	Gly	Glu	Arg	Leu	Glu	Gln	Ser	Leu	Asn	Pro	Tyr	Tyr	His	Leu	Val
			100					105					110		
Ser	Thr	Val	Leu	Glu	Ala	Arg	Lys	Ile	Ile	Phe	Ala	Thr	Glu	Lys	Pro
		115					120					125			
Ile	Val	Val	Leu	Arg	Leu	Pro	Val	Tyr	Ile	Ala	Thr	Ser	Gly	Asn	Gln
	130					135					140				
Ser	Tyr	Tyr	Phe	Ser	Glu	Thr	Lys	Phe	Arg	Glu	Leu	Ser	Glu	Glu	Tyr
145					150					155					160
His	Lys	His	Val	Ala	Phe	Ile	Leu	Ile	Thr	Glu	Pro	Glu	Phe	Asn	Glu
			165						170					175	
Asp	Cys	Ser	Trp	Ser	Phe	Phe	Leu	Arg	Ala	Lys	Lys	Ile	Thr	Ala	Arg
			180					185					190		
Ile	Lys	Gly	Pro	Met	Asp	Cys	Asn	Leu	Val	Glu	Glu	Cys	Met	Pro	Lys
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 caatcagacc ccagggtattg aagatggagc agccccagct ctcattcccc gttgcctgcc 180
 tgagagccct ggtgatttct ttccagtttc ctgaggttgt tccccttaac atcgaggagg 240
 ctcaattcac tacacgcttg tccacactgc ggtgctacga agacaccatg ttggcagcca 300
 tgttcagtgg gcggcactac atccccacgg actccgaggg ccggtacttc atcgaccgag 360
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Gly Gly Ala His Phe Thr Thr Arg Leu Ser Thr Leu Arg
 1 5 10

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Thr Thr Arg Leu Ser Thr Leu Arg Cys Tyr Glu Asp Thr
 1 5 10

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Leu Ala Ala Met Phe Ser Gly Arg His Tyr Ile Pro Thr
 1 5 10

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 1 5 10 15

Ser Thr Leu Arg Cys Tyr Glu Asp Thr Met Leu Ala Ala Met Phe Ser
 20 25 30

Gly Arg His Tyr Ile Pro Thr Asp Ser Glu Gly Arg Tyr Phe Ile Asp
 35 40 45

Arg Asp Gly Thr His Phe Gly Asp Val Leu Asn Phe Leu Arg Ser Gly

50 55 60

Asp Leu Pro Pro Arg Glu Arg Val Arg Ala Val Tyr Lys Glu Ala Gln
65 70 75 80

Tyr Tyr Ala Ile Gly Pro Leu Leu Glu Gln Leu Glu Asn Met Gln Pro
85 90 95

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1 5 10 15

Lys Met Pro Pro Gly Val Thr Ser Trp
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35 40 45

Gln Glu Ser Lys Cys His Leu Ile Glu Thr Asn Ile Arg Asp Gln Glu
50 55 60

Glu Leu Lys Gly Lys Lys Val Pro Gln Tyr Pro Cys Leu Trp Val Asn
65 70 75 80

Val Ser Ala Ala Gly Arg Trp Ala Val Leu Tyr His Thr Glu Asp Thr
85 90 95

Arg Asp Gln Asn Gln Gln Cys Ser Tyr Ile Pro Gly Ser Val Asp Asn
100 105 110

Tyr Gln Thr Ala Arg Ala Asp Val Glu Lys Val Arg Ala Lys Phe Gln
115 120 125

Glu Gln Gln Val Phe Tyr Cys Phe Ser Ala Pro Arg Gly Asn Glu Thr
130 135 140

Ser Val Leu Phe Gln Arg Leu Tyr Gly Pro Gln Ala Leu Leu Phe Ser

[illegible]

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			180					185					190		